IN THE CLAIMS:

Claim 1 (currently amended) A catalyst component for ethylene polymerization, comprising an inorganic oxide support, and at least one alkyl metal compound, at least one halide, at least one dihydrocarbyl magnesium compound, at least one ~~difuntional~~ difunctional compound that reacts with the dihydrocarbyl magnesium compound and at least one titanium compound, which are supported on the support, wherein

(1)the alkyl metal compound is represented by formula (I):

$M'R^1R^2R^3$ ~~$MeR^1R^2R^3$~~ (I)

wherein R^1, R^2 and R^3, which are ~~may be~~ identical or different, are C_1-C_{20} alkyl, M' ~~Me~~ is an element of IIIA group of the Periodic Table;

(2)the halide is a C_1-C_{20} alkyl halide, or a compound represented by formula (II) MX_n, in which M is an element of IIIA,IVA,VA,IIIB,IVB or Vb groups of the Periodic Table, X is F, Cl or Br, and n=3, 4 or 5~~, or a C_1-C_{20} alkyl halide~~; and

(3)the difunctional compound is a mono-, di- or multi-halogenated alcohol or phenol having from 2 to 20 carbon atoms; or a mono-, di- or multi-halogenated acyl ~~acid~~ halide having from 2 to 20 carbon atoms.

Claim 2 (original) The catalyst component for ethylene polymerization according to claim 1, wherein in the compound of formula (II), X is chloride.

Claim 3 (currently amended) The catalyst component for ethylene polymerization according to claim 2, wherein the compound of formula (II) is at least one selected from the group consisting of $AlCl_3$, BCl_3, $SiCl_4$, $TiCl_4$, ~~$NdCl_2$,~~ CCl_4, $CH_3CH_2CH_2CH_2Cl$ and $(CH_3)_3CCl$.

Claim 4 (original) The catalyst component for ethylene polymerization according to claim 1, wherein the difunctional compound is a mono-, di- or multi-halogenated alcohol or phenol having from 2 to 20 carbon atoms.

Claim 5 (original) The catalyst component for ethylene polymerization according to claim 4, wherein the difunctional compound is at least one selected from the group consisting of Cl_3CCH_2OH, Cl_2CHCH_2OH, $ClCH_2CH_2OH$, $Cl_3CC(CH_3)_2OH$, $ClCH_2CH_2CH_2CH_2OH$, o-chlorophenol, m-chlorophenol, p-chlorophenol, and 2-chloro-cyclohexanol.

Claim 6 (original) The catalyst component for ethylene polymerization according to claim 1, wherein the difunctional compound is a mono-, di- or multi-halogenated acid halide having from 2 to 20 carbon atoms.

Claim 7 (original) The catalyst component for ethylene polymerization according to claim 6, wherein the difunctional compound is at least one selected from the group consisting of Cl_3CCOCl, $Cl_2CHCOCl$, $ClCH_2COCl$, and o-chlorobenzoyl chloride.

Claim 8 (currently amended) The catalyst component for ethylene polymerization according to claim 1, wherein the dihydrocarbyl magnesium compound is represented by formula (IV):

$$MgR^6R^7 \qquad (IV)$$

in which R^6 and R^7, which ~~may be~~ identical or different, are C_2-C_{20} hydrocarbyl.

Claim 9 (currently amended) The catalyst component for ethylene polymerization according to claim 8, wherein in the dihydrocarbyl magnesium compound of formula (IV), R^6 and R^7, which ~~may be~~ are identical or different, are C_2-C_{12} alkyl.

Claim 10 (currently amended) The catalyst component for ethylene polymerization according to claim 1, wherein the titanium compound is represented by formula (V):

$$Ti(OR^8)_{4-m}X_m \qquad (V)$$

in which R^8 is a C_1-C_{14} linear or branched aliphatic hydrocarbyl, X is selected from the group consisting of F, Cl, Br, and ~~mixture~~ mixtures thereof, and m is an integer of from 1 to 4.

Claim 11 (original) The catalyst component for ethylene polymerization according to claim 10, wherein the titanium compound of formula (V) is titanium tetrachloride.

Claim 12 (original) The catalyst component for ethylene polymerization according to claim 1, wherein the inorganic oxide support is at least one selected from the group consisting of silica, alumina, silica-alumina, magnesia, titania, chromia, and zirconia.

Claim 13 (currently amended) A process for the preparation of the catalyst component for ethylene polymerization according to claim 1, comprising the steps of:

(1)contacting an inorganic oxide support with an alkyl metal compound having formula:

$M'R^1R^2R^3$ ~~$MeR^1R^2R^3$~~ (I)

in which R^1, R^2 and R^3, which are ~~may be~~ identical or different, are C_1-C_{20} alkyl, M' ~~Me~~ is an element of IIIA group of the Periodic Table, to obtain a treated inorganic oxide support;

(2)contacting the treated inorganic oxide support obtained from the step (1) with a dihydrocarbyl magnesium compound;

(3)contacting the product obtained from the step (2) with a difunctional compound, which is a mono-, di- or multi-halogenated alcohol or phenol having from 2 to 20 carbon atoms, or a mono-, di- or multi-halogenated acryl ~~acid~~ halide having from 2 to 20 carbon atoms;

(4) contacting the product obtained from the step (3) with a halide, which is a C_1-C_{20} alkyl

halide, or a compound represented by formula (II) MX_n, in which M is an element of IIIA, IVA, VA, IIIB, IVB or VB groups of the Periodic Table, X is F, Cl or Br, and n=3, 4 or 5~~, or a C_1-C_{20} alkyl halide~~; and

(5) contacting the product obtained from the step (4) with a titanium compound to obtain a catalyst component.

Claim 14 (currently amended) The process according to claim 13, wherein the amount of the compound of formula (I) used is from 0.1 to 5.0 mmol~~, preferably from 0.3 to 1.5 mmol~~; the amount of the halide used is from 0.1 to 5.0 mmol, ~~preferably from 0.3 to 1.2 mmol~~; the amount of the difunctional compound used is from 0.2 to 10 mmol, ~~preferably from 0.5 to 3.0 mmol~~; the amount of dihydrocarbyl magnesium compound used is from 0.25 to 5.0 mmol, ~~preferably from 0.5 to 3.0 mmol~~; and the amount of the titanium compound used is from ~~0.1 to 5.0 mmol, preferably from 0.5 to 2.0 mmol~~, with respect to 1 gram of the inorganic oxide support; and wherein the molar ratio of the difunctional compound to the dihydrocarbyl magnesium compound is controlled to a range of 0.8 to 2.5~~, preferably 0.9 to 2.2~~.

Claim 15 (currently amended) A catalyst for ethylene polymerization, comprising:

(a)the catalyst component for ethylene polymerization according to claim 1; and

(b)at least one organoaluminium compound of formula AlR_nX_{3-n}, wherein R are independently ~~each other~~ hydrogen or hydrocarbyl having from 1 to 20 carbon atoms, X are independently each other halogen, and n is an integer ~~a value~~ meeting the condition of 1 < n £3.

Claim 16 (currently amended/withdrawn) A process for ethylene polymerization, comprising the ~~step~~ steps of (a) providing the catalyst of claim 15, and (b) contacting ethylene and optionally a comonomer or comonomers ~~optional comonomer(s)~~ with the catalyst ~~according to claim 15~~ under polymerization conditions.

Claim 17 (currently amended) A process for the preparation of the catalyst component for ethylene polymerization according to claim 2, comprising the steps of:

(1) contacting an inorganic oxide support with an alkyl metal compound having formula:

$M'R^1R^2R^3$ ~~$MeR^1R^2R^3$~~ (I)

in which R^1, R^2 and R^3, which are ~~may be~~ identical or different, are C_1-C_{20} alkyl, M' ~~Me~~ is an element of IIIA group of the Periodic Table, to obtain a treated inorganic oxide support;

(2) contacting the treated inorganic oxide support obtained from the step (1) with a dihydrocarbyl magnesium compound;

(3) contacting the product obtained from the step (2) with a difunctional compound, which is a mono-, di- or multi-halogenated alcohol or phenol having from 2 to 20 carbon atoms, or a mono-, di- or multi-halogenated acyl ~~acid~~ halide having from 2 to 20 carbon atoms;

(4) contacting the product obtained from the step (3) with a chloride ~~halide~~, which is a C_1-C_{20} alkyl chloride, or a compound represented by formula (II) MX_n, in which M is an element of IIIA, IVA, VA, IIIB, IVB or VB groups of the Periodic Table, X is ~~F,~~ Cl ~~or Br~~, and n=3, 4 ~~or~~ 5, ~~or a C_1-C_{20} alkyl halide~~; and

(5) contacting the product obtained from the step (4) with a titanium compound to obtain a catalyst component.

Claim 18 (currently amended) A process for the preparation of the catalyst component for ethylene polymerization according to claim 3, comprising the steps of:

(1) contacting an inorganic oxide support with an alkyl metal compound having formula:

$M'R^1R^2R^3$ ~~$MeR^1R^2R^3$~~ (I)

in which R^1, R^2 and R^3, which ~~may be~~ identical or different, are C_1-C_{20} alkyl, M' ~~Me~~ is an element of IIIA group of the Periodic Table, to obtain a treated inorganic oxide support;

(2) contacting the treated inorganic oxide support obtained from the step (1) with a dihydrocarbyl magnesium compound;

(3) contacting the product obtained from the step (2) with a difunctional compound, which is a mono-, di- or multi-halogenated alcohol or phenol having from 2 to 20 carbon atoms, or a mono-, di- or multi-halogenated acyl ~~acid~~ halide having from 2 to 20 carbon atoms;

(4) contacting the product obtained frm the step (3) which a chloride ~~halide~~, which is a C_1-C_{20} alkyl chloride, or a compound represented by formula (II) MX_n, in which M is an element of IIIA, IVA, VA, IIIB, IVB or VB groups of the Periodic Table, X is F, C1 or Br, and n=3, 4 or 5, ~~or a C_1-C_{20} alkyl halide~~; and

(5) contacting the product obtained from the step (4) with a titanium compound to obtain a catalyst component.

Claim 19 (currently amended) A process for the preparation of the catalyst component for ethylene polymerization according to claim 4, comprising the steps of:

(1) contacting an inorganic oxide support with an alkyl metal compound having formula:

$M'R^1R^2R^3$ ~~$MeR^1R^2R^3$~~ (I)

in which R^1, R^2 and R^3, which are ~~may be~~ identical or different, are C_1-C_{20} alkyl, M' ~~Me~~ is an element of IIIA group of the Periodic Table, to obtain a treated inorganic oxide support;

(2) contacting the treated inorganic oxide support obtained from the step (1) with a dihydrocarbyl magnesium compound;

(3) contacting the product obtained form the step (2) with a difunctional compound, which is a mono-, di- or multi-halogenated alcohol or phenol having from 2 to 20 carbon atoms~~, or a mono-, di- or multi-halogenated acid halide having from 2 to 20 carbon atoms~~;

(4) contacting the product obtained from the step (3) with a halide, which is a C_1-C_{20} alkyl

halide, or a a compound represented by formula (II) MX_n, in which M is an element of IIIA, IVA, VA, IIIB, IVB or VB groups of the Periodic Table, X is F, Cl or Br, and n=3, 4 or 5, ~~or a C_1-C_{20} alkyl halide~~; and

(5) contacting the product obtained from the step (4) with a titanium compound to obtain a catalyst component.

Claim 20 (currently amended) A process for the preparation of the catalyst component for ethylene polymerization according to claim 5, comprising the steps of:

(1) contacting an inorganic oxide support with an alkyl metal compound having formula:

$M'R^1R^2R^3$ ~~$MeR^1R^2R^3$~~ (I)

in which R^1, R^2 and R^3, which are ~~may be~~ identical or different, are C_1-C_{20} alkyl, M' ~~Me~~ is an element of IIIA group of the Periodic Table, to obtain a treated inorganic oxide support;

(2) contacting the treated inorganic oxide support obtained form the step (1) with a dihydrocarbyl magnesium compound;

(3) contacting the product obtained from the step (2) with a difunctional compound, which is at least one selected from the group consisting of Cl_3CCH_2OH, Cl_2CHCH_2OH, $ClCH_2CH_2OH$, $Cl_3CC(CH_3)_2OH$, $ClCH_2CH_2CH_2CH_2OH$, o-chlorophenol, m-chlorophenol, p-chlorophenol, and 2-chloro-cyclohexanol ~~a mono-, di- or multi-halogenated alcohol or phenol having from 2 to 20 carbon atoms, or a mono-, or multi-halogenated acid halide having from 2 to 20 carbon atoms~~;

(4) contacting the product obtained from the step (3) with a halide, which is C_1-C_{20} alkyl halide, or a a compound represented by formula (II) MX_n, in which M is an element of IIA, IVA, VA, IIIB, IVB or VB groups of the Periodic Table, X is F, Cl or Br, and n=3, 4 or 5, ~~or a C_1-C_{20} alkyl halide~~; and

(5) contacting the product obtained form the step (4) with a titanium compound to obtain a catalyst component

Claim 21 (New). A catalyst component for ethylene polymerization, comprising an inorganic oxide support, and at least one alkyl metal compound, at least one halide, at least one dihydrocarbyl magnesium compound, at least one difunctional compound that reacts with the dihydrocarbyl magnesium compound and at least one titanium compound, which are supported on the support, said catalyst component being obtained by a process comprising the steps of:

(1)contacting the inorganic oxide support with an alkyl metal compound having formula:

$$M'R^1R^2R^3 \quad (I)$$

in which R^1, R^2 and R^3, which are identical or different, are C_1-C_{20} alkyl, M' is an element of IIIA group of the Periodic Table, to obtain a treated inorganic oxide support;

(2)contacting the treated inorganic oxide support obtained from the step (1) with the dihydrocarbyl magnesium compound;

(3)contacting the product obtained from the step (2) with the difunctional compound, which is a mono-, di- or multi-halogenated alcohol or phenol having from 2 to 20 carbon atoms, or a mono-, di- or multi-halogenated acryl halide having from 2 to 20 carbon atoms;

(4) contacting the product obtained from the step (3) with a halide, which is, or a C_1-C_{20} alkyl halide a compound represented by formula (II) MX_n, in which M is an element of IIIA, IVA, VA, IIIB, IVB or VB groups of the Periodic Table, X is F, Cl or Br, and n=3, 4 or 5; and

(5) contacting the product obtained from the step (4) with the titanium compound to obtain the catalyst component.

Claim 22 (new). The catalyst component according to claim 1, wherein the catalyst component consists of the inorganic support, the at least one alkyl metal compound, the at least one halide, the at least one dihydrocarbyl magnesium compound, the at least one difunctional compound, and the at least one titanium compound.

Claim 23 (new). The catalyst according to claim 15, wherein the catalyst consists of the inorganic support, the at least one alkyl metal compound, the at least one halide, the at least one dihydrocarbyl magnesium compound, the at least one difunctional compound, the at least one titanium compound, and the at least one organoaluminum compound.